



Stormwater Management Pond Plan Review Checklist

Project Name: _____ Engineer/Phone No. _____

Sediment Control Permit No.: _____

SWM File No.: _____ Assigned/Phone No. _____

Plan Type: _____ Submittal Date _____ Review Date _____ Initial _____

Legend:

INC Incomplete/Incorrect
N/A Not Applicable
SC Sediment Control
SWM Stormwater Management
FPDP Floodplain District Permit
DA Drainage Area
SPA Special Protection Area

Plan Acceptable Date _____

This checklist has been developed to provide specific instruction to engineers. All items are expected to be addressed in the first submittal. Failure to do so may result in less than a full first review.

TO THE ENGINEER:

Your submission for Stormwater Management Pond Plan approval has been reviewed. The review was made per the following checklist. **Please return the checklist and Pond plan comment sheets with your resubmittal.** The second submission must include payment of the balance of the review fee in order to be accepted for further review. If you do not address a checklist item, including comments on the Pond plan sheets, explain your reasoning in your transmittal letter.

SUPPORTING INFORMATION (One Copy)

____ Pond Summary Sheet (NRCS MD-ENG-14)

____ Stormwater Management Design Plan Information Form (IF-1)

____ Maintenance Easement and Covenant Documents

____ Itemized Stormwater Management Construction Estimate.

____ Drainage Area Map (200-scale, or larger, with site and drainage area boundaries) showing: off-site areas; pre-developed and ultimate land uses with corresponding acreage; pre-developed and ultimate development time of concentration (Tc) flowpaths).

____ Soils map with site and drainage area(s) outlined.

____ Storm drain plans for any areas not draining directly to the pond (must show safe structural conveyance).

____ Storm drain systems conveying off-site storm water must meet public (MCDPW&T) storm drainage system standards.

Site in conformance with Approved Stormwater Management Concept, Preliminary Plan and/or Site Plan requirements or comments.

STORMWATER MANAGEMENT COMPUTATIONS

A. HYDROLOGY

RCN determinations for CP_V : ultimate development (any existing developed off-site areas considered as existing condition).

Time of Concentration (T_C) for CP_V computations: ultimate development (same policy on existing off-site areas as RCN determination).

For safety storm routings (10-year, 100-year), RCN and T_C determinations must be based on the entire drainage area under ultimate development conditions, per zoning.

Compute channel protection volume (CP_V)

Use 24-hour extended detention for Class I watersheds. Use 12-hour for Class III and Class IV watersheds.

Hydrograph and NRCS TR-20 routing for appropriate ultimate development (including off-site areas) safety storms (criteria from MD-378, Table 1).

“Safety Check” storm routing is required if any low flow openings of 6-inches or smaller in any direction are called for in the design. Low flow openings of 6-inches and smaller in any direction must be considered blocked for a separate routing of the 100-year storm. The routing must start at an opening greater than 6-inches in all directions, and the resultant water surface elevation must not overtop the embankment.

B. ASSORTED COMPUTATIONS

Design narrative

Written “Dam Hazard Classification” statement.

Elevation-Storage (include graph and table)

Required and provided permanent pool volume, if applicable.

Extended detention volume and discharge (if applicable).

Elevation-Discharge (provide equations and cite references).

Check for barrel control prior to riser orifice flow.

Anti-seep collar design.

Flotation analysis (factor of safety = 1.2:1).

Pond drain drawdown (24 hours maximum from permanent pool).

Danger reach study, if required.

GEOLOGICAL INVESTIGATION (One Copy)

Geotechnical report with construction/design recommendations.

Minimum boring locations: borrow area; pool area; principal spillway; top of dam near one abutment or emergency spillway, if provided.

_____ Boring logs with Unified Soil Classification, blow counts and soil descriptions.

_____ If groundwater is within 1 foot of the proposed bottom of a dry pond, drain tile is required.

STORMWATER MANAGEMENT PLAN

A. PLAN VIEW OF POND AT SCALE OF 1" = 50' OR LESS (40', 30', ETC.)

1. GENERAL ITEMS

_____ Existing and final contours (1' or 2' interval).

_____ Existing and proposed improvements

_____ Delineation of permanent, extended detention 10- and 100-year pools. If the 10-year exits the emergency spillway, 5-year water surface elevation must be delineated.

_____ Locations of test borings

_____ Outflow pipe, outlet protection (detail required); outfall channel.

_____ Inflow improvements (appropriate details required); storm drains carried to normal pool (wet) or pond bottom (dry), with appropriately sized rip rap outfalls transitioning to low flow channel dimensions.

_____ Low Flow Channel required for all ponds: bottom width = pipe diameter; minimum of 1' depth and 2' wide flat bottom; inverts at 50-foot intervals; details required. Stabilize with grass and turf reinforcement material.

_____ Emergency spillway level section and outlet channel.

_____ Existing and proposed utility location/protection. Pipes and utilities not parallel to the axis of the dam shall meet all principal spillway requirements. Pipes and utilities parallel to the axis of the dam shall be constructed with no granular bedding.

_____ Ponding and/or pond slopes on private property must have easements.

_____ MCDPS Turf Reinforcement detail on plans.

3. MAINTENANCE ITEMS

_____ Maintenance access from public right-of-way or publicly traveled road (e.g. private road in a townhouse project): minimum width 12-feet, no steeper than 10% (15% if mechanically stabilized). Provide MCDPS standard driveway apron at access point to facilities located in greenspace.

_____ Maintenance Easement (Shall include riser structure, embankment, outfall, 100-year ponding area, access, and adjacent property as necessary. Show easement on plan view.

_____ Minimum permanent pool depth 4-feet (except wetland ponds).

_____ Submerged pond bank slope 3:1.

_____ Forebay (if required).

_____ Dry pond bottom sloped no flatter than 2% to a low flow channel.

_____ Slopes – No steeper than 3:1 anywhere around the pond (except where natural topography is preserved or for the downstream toe of a dam used as a public roadway). Slopes above the permanent pool of a wet pond no steeper than 4:1, 3:1 with safety bench*, or 2:1 if natural topography is preserved and a safety bench* is provided.

*Bench must be a minimum of 15-feet wide and 1-foot above the permanent pool elevation or at the extended detention pool elevation, if provided.

B. LANDSCAPING / MULTIPLE USE / AESTHETIC CONSIDERATIONS

____ Landscaping plan required (low maintenance vegetation on steep slopes, only approved shrubs and bedding stock on the dam, optional reforestation outside the 2-year pool, aquatic plantings, etc.) If the embankment will serve as a roadway, refer to MD-378 for planting requirements. Clearly delineate areas of the pond that are to remain in turf grass, including the embankment setbacks and the pond access area.

____ Use natural, variable looking slope shapes.

____ Landscape plan prepared and sealed by a landscape architect registered in the state of Maryland.

C. PRINCIPAL SPILLWAY PROFILE AND ASSOCIATED DETAILS

3. EXISTING AND PROPOSED GROUND

____ Dam side slopes labeled.

____ Top width (from MD-378, minimum 10-feet)

4. FOUNDATION CUTOFF (CORE TRENCH)

____ Bottom width (4-feet minimum)

____ Side slopes (1:1 maximum slope)

____ Depth (4-feet minimum)

5. IMPERVIOUS CORE (ZONED FILL / EMBANKMENT CORE)

____ Top width (4-feet minimum)

____ Side slopes (1:1 maximum)

____ Height (extend at least up to the 10-year water surface elevation)

____ Material to be GC, SC, CH or CL

6. BARREL

____ Must be concrete for diameters less than or equal to 48-inches; all concrete barrels must be labeled as meeting ASTM C-361; all barrels must be circular, with the following information provided: inside diameter, class, length, and slope.

____ Bedding (cradle) for concrete barrels (Detail required). Must extend at least to the spring line of the pipe, and a minimum thickness of 6-inches below the pipe.

____ Gauges, corrugation size and permanent coating (if metal)

____ First pipe joint to be located within four feet of the riser face, but not less than two feet.

7. RISER OR SIMILAR STRUCTURE (SPECIFIC DETAIL REQUIRED)

____ To be same material as the barrel.

____ To be poured or pre-cast. If pre-cast, provide standard shop drawing note.
“Shop drawing must be approved by the engineer and accepted by MCDPS prior to fabrication”.

_____	_____	_____	Cast-in-place concrete collar (for pre-cast risers only). Detail required.
_____	_____	_____	All structure dimensions.
_____	_____	_____	Structural details for cast-in-place structures.
_____	_____	_____	High stage trash rack (removable, hot dipped galvanized, minimum #6 rebar on 8-inch centers both ways with vertical bars on the outside).
_____	_____	_____	Bolted 30-inch diameter manhole covers.
_____	_____	_____	Anti-vortex device (detail needed if required)
_____	_____	_____	Maintenance access.
_____	_____	_____	Structural computations (signed and sealed) for cast-in-place designs.

6. **ORIFICE(S) AND TRASH RACKS (DETAIL REQUIRED)**

_____	_____	_____	Dimensions
_____	_____	_____	Wet or wetland ponds: non-clogging, non-hydraulically interfering inlet drawing water from at least one foot below permanent pool and 50% of total depth above pond bottom (e.g. corrosion resistant, removable hood; turned down elbow, or reverse slope pipe hidden in dam)
_____	_____	_____	Dry pond: For orifice(s) \geq 6-inches; removable, hot dipped galvanized, minimum #6 rebar trash rack with an area \geq 6 times the protected opening area; 4:1 upstream face, maximum bar spacing = 6-inches, and vertical bars on the outside. If < 6-inches, use expanded galvanized steel grate. Orifice size <3-inches not allowed without specific permission of MCDPS.

7. **POND DRAIN (for wet ponds only)**

_____	_____	_____	Ductile iron or concrete pipe.
_____	_____	_____	Easily accessible, non-clogging, reseating valve
_____	_____	_____	Inlet prevents uptake of sediment (removable elbow)
_____	_____	_____	Extend valve stem to the top slab of the riser.

8. **ANTI-SEEP COLLARS (DETAIL REQUIRED)**

_____	_____	_____	Size – 15% increase in L_s using outside pipe diameter
_____	_____	_____	Spacing and location on barrel
_____	_____	_____	Labeled as being located at least 2-feet from a pipe joint
_____	_____	_____	Material and method of connection
_____	_____	_____	Phreatic line (4:1 slope): measured from the intersection of the dam and a horizontal projection of the 10-year water surface elevation.

9. **OUTFALL PROTECTION (DETAIL REQUIRED)**

_____	_____	_____	Size for maximum barrel release (but not greater than 10-year storm)
_____	_____	_____	Cross-section at end of the channel in accordance with receiving section
_____	_____	_____	Outfall dimensions

_____	_____	_____	Slope – 0%
_____	_____	_____	Median rip-rap size (d_{50})
_____	_____	_____	Thickness ($2.0 \times d_{50}$)
_____	_____	_____	Approved filter cloth

10. ELEVATIONS: (INCLUDES REQUIRED FREEBOARD)

_____	_____	_____	Top of dam (1-foot freeboard above 100-year pool with an emergency spillway, 2-feet without)
_____	_____	_____	Crest of emergency spillway (2-feet minimum below top of settled embankment)
_____	_____	_____	Crest of riser (1-foot minimum below crest of emergency spillway, if provided)
_____	_____	_____	Pools: permanent, extended detention and appropriate safety storms
_____	_____	_____	Inlet and outlet inverts of pipes, percent slope

D. PROFILE SECTION OF DAM ALONG CENTERLINE

_____	_____	_____	Existing ground
_____	_____	_____	Proposed grade
_____	_____	_____	Top of dam (constructed and settled) - add 5% additional fill to account for settlement
_____	_____	_____	Location of emergency spillway with side slopes labeled
_____	_____	_____	Bottom of core trench (4-foot minimum)
_____	_____	_____	Top of impervious core (zoned fill) - GC, SC, CH, CL material.
_____	_____	_____	Barrel location
_____	_____	_____	Existing and proposed utility location/protection. Pipes and utilities not parallel to the axis of the dam shall meet all principal spillway requirements. Pipes and utilities parallel to the axis of the dam shall be constructed with no granular bedding.
_____	_____	_____	All excavation for pipe spillways, whether into existing or natural ground, shall have side slopes of 2:1. Foundation cutoff trench side slopes shall be 1:1 in profile and dam centerline cross section.

E. EMERGENCY SPILLWAY PROFILE ALONG CENTERLINE

_____	_____	_____	Existing ground
_____	_____	_____	Inlet, level (control) and outlet sections
_____	_____	_____	Spillway crest elevation
_____	_____	_____	Design must be per NRCS references.

F. MISCELLANEOUS ITEMS

_____	_____	_____	Title block (subdivision name with lots and blocks for which control is provided)
_____	_____	_____	Inspector Checkoff List / Sequence of Construction
_____	_____	_____	Soil logs on plan

ADDITIONAL REQUIREMENTS /COMMENTS:This image shows a single sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.